Emotional Content Influences the Simon Effect

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Background

It can be noted that the different areas of the brain involved in a task response must work together to produce a viable outcome (i.e. lateralized brain processes). While there are laterality components in relation to the cognitive processes of handed and footed responses, it is still largely unknown *how* the different areas of the brain interpret the emotional stimuli to then affect these outcomes.

Purpose

The purpose of this study was to determine if an emotional context affects a simple cognitive task that includes handed and footed responses, and if any observed differences can be traced back to the different systems at work within the brain.

Hypothesis

It was hypothesized that under highly emotional stimuli, the hand responses would be impacted more strongly, as shown in the figure below.

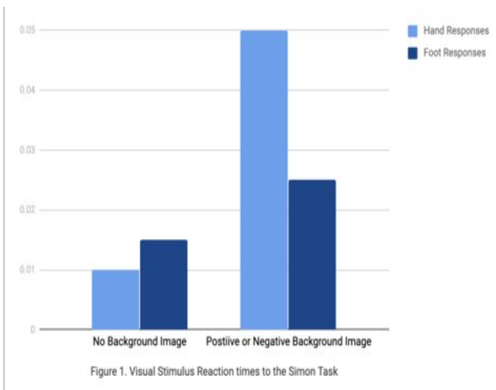


Figure 1. Visual Stimulus Reaction times to the Simon Task

Methods

Day 1

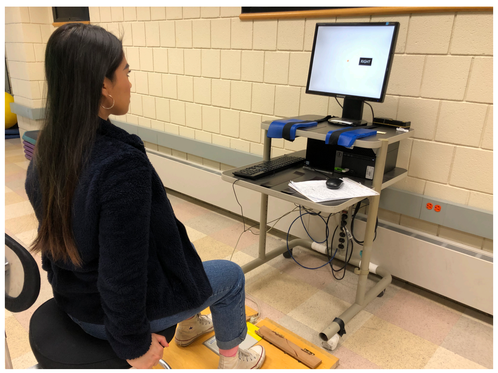
- Informed Consent
- POMS, Handedness & Footedness Questionnaires
- Familiarity Simon hand trials
- Baseline Simon hand trials
- Neutral Simon hand trials
- High Valence, High Arousal Simon hand trials
- High Valence, Low Arousal Simon hand trials
- Familiarity Simon foot trials
- Baseline Simon foot trials
- Neutral Simon foot trials
- High Valence High Arousal Simon foot trials
- High Valence Low Arousal Simon foot trials

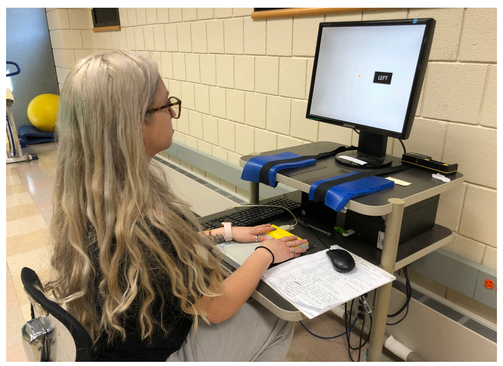
Day 2

- POMS
- Familiarity hand trials
- Baseline hand trials
- Neutral hand trials
- Low Valence Low Arousal hand trials
- Low Valence High Arousal hand trials
- Familiarity foot trials
- Baseline foot trials
- Neutral foot trials
- Low Valence Low Arousal foot trials
- Low Valence High Arousal foot trials

*48 trials per condition, total of 960 trials

10 subjects were tested on the Simon Effect reaction time test with and without emotional context (i.e. a background image of a specific valence and arousal rating), and any resulting differences between non-emotional context and emotional context reaction times were compared. The Simon test mixes stimulus-response alternatives that are spatially compatible and spatially non-compatible, e.g., the LL condition was a left side limb response with a stimulus presented on the left side.





Results

Simon	Mean (ms)	SE
LL	1047.1	5.0
LR	1055.1	5.2
RL	1051.8	5.9
RR	1036.7	5.1

Limb	Mean (ms)	SE
Arm	976.9	6.7
Leg	1118.3	6.7

As shown in the tables, arms were significantly faster ($p < .01$) than legs, and the RR response was significantly faster than the LL, LR, & RL responses.

There were no apparent effects of the emotional processing on reaction time.

Conclusions

There were no significant differences or interaction effects among responses with emotional context, and responses with neutral or no emotional context. These results must be viewed in light of a small sample size of these pilot data.